

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of )  
 )  
Commission Seeks ) ET Docket No. 02-135  
Public Comment on )  
Spectrum Policy Task Force )  
Report )  
 )

To: The Commission

**JOINT COMMENTS OF  
THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC.  
AND THE NATIONAL ASSOCIATION OF BROADCASTERS**

January 27, 2003

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## SUMMARY

MSTV and NAB encourage the Commission to (i) commit itself to successful completion of the digital transition before considering additional spectrum policy changes affecting the broadcast spectrum; and (ii) tackle the difficult and still unresolved issues involved in developing and enforcing strategies to deal with the real-world interference consequences of some of the spectrum sharing ideas broadly outlined by the Task Force. As it pursues these objectives, the Commission should make it a priority to preserve the benefits associated with valuable existing services, including broadcasting, and the future benefits of digital broadcasting. If it wishes to launch a first-step experiment with the Task Force's spectrum management ideas, the Commission should use spectrum other than television spectrum, which is subject to so many difficult challenges and burdens over the course of the digital transition.

**Digital Transition.** The Commission should delay consideration of additional non-conforming uses in the broadcast spectrum until after the digital transition. Focusing on costs and benefits, as the Task Force recommended, the Commission should agree that the costs of adding a layer of additional non-conforming uses on top of the digital transition outweigh the benefits.

Additional non-conforming uses would make digital interference issues more complex and their resolution more costly. Broadcasters' lack of control over receivers would further magnify transition costs relative to other bands, where service providers control both transmitters and receivers. And because television broadcast service reaches 98% of the public, curtailment of the DTV transition would cause significant, widespread harm to the public interest. For these reasons, any near-term introduction of additional non-conforming uses or other major spectrum policy changes should be directed to other bands.

The overwhelming regulatory priority in the broadcast bands should be the successful completion of the digital transition. This national policy should take precedence over any other spectrum policy changes in the broadcast television and radio bands. Injecting additional uses of already crowded broadcast spectrum will obstruct and burden the transition, draining its momentum. Broadcasters are just beginning market testing of In-Band-On-Channel digital broadcast radio. Moreover, the adjustment period that broadcasters and the public are undergoing to resolve co-channel DTV interference has already been difficult. An initiative to introduce secondary sources of interference at this stage would delay or derail the transition.

**Minimizing Interference.** The Task Force has correctly identified two important principles for minimizing interference. First, the Commission should seek to quantify existing interference in concrete terms. Second, it should, where possible, base interference management decisions — including decisions on whether to allow new devices and technologies to operate in a particular spectrum band — on actual, measured interference rather than on often inaccurate interference predictions. MSTV and NAB support both of these principles.

While correct in principle about the importance of real-world interference assessment, the Task Force Report does not provide key details needed to assess whether and how the “interference temperature” approach will work in practice. It does not say how the Commission should establish the initial “interference temperature” metric, nor how that process would ensure adequate protection for existing receivers in use by consumers. The Task Force

does not explain exactly how it proposes to quantify the noise floor. It identifies no practical means of putting in place the network of spectrum monitoring equipment needed to scan the entire RF environment. It leaves important technical questions, such as how to cope with out-of-band emissions, unanswered. Also unanswered is the question of greatest ultimate importance: How can the interference temperature metric, which essentially serves a monitoring function, provide a real, enforceable remedy for existing and future interference?

These questions reveal the need for a more concrete roadmap for interference control. The Commission needs a set of immediate priorities to guide its work on interference temperature and other promising ideas for minimizing interference. MSTV and NAB propose that the Commission look to the following priorities to guide further work on interference issues:

- Preservation of the benefits associated with analog broadcasting and the future benefits of digital broadcasting.
- Reliance going forward on actual interference levels, and a commitment to remedy existing interference problems caused by incorrect predictions.
- Establishment of robust equipment performance standards.
- Introduction of genuine accountability for interference.
- Careful and realistic assessment of new technologies so as to avoid interference to existing services.
- Encouragement of common-business-interest spectrum communities that facilitate spectrum sharing among users with compatible interests.

Recognizing the increasing demands on spectrum, MSTV and NAB look forward to working with the Commission to help facilitate the most efficient use of spectrum in all bands. We understand that this may require new, creative approaches to spectrum use. Nonetheless, our starting point must be to ensure that valuable existing broadcast services and new digital services remain viable and competitive in this new environment.

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**JOINT COMMENTS OF  
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AND THE NATIONAL ASSOCIATION OF BROADCASTERS**

The Association for Maximum Service Television, Inc. (“MSTV”), and the National Association of Broadcasters (“NAB”)<sup>1</sup> welcome the Report of the Spectrum Policy Task Force (“Task Force”).<sup>2</sup> As the Report recognized, broadcasters are committed to a comprehensive transition involving both new and more efficient technology and greater spectrum flexibility.<sup>3</sup> This digital transition represents the most radical spectrum policy reform in the history of broadcasting, and we are in the midst of it.

In the wake of the Report, however, MSTV and NAB jointly call on the Commission to (i) commit itself to successful completion of the digital transition before considering additional spectrum policy modifications affecting the television broadcast

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<sup>1</sup> MSTV is a non-profit trade association of local broadcast television stations committed to achieving and maintaining the highest technical quality for the local broadcast system. NAB is a non-profit, incorporated association of radio and television stations and networks that serves and represents the American broadcast industry.

<sup>2</sup> Report of the Spectrum Policy Task Force, ET Docket No. 02-135 (Nov. 2002) (“Task Force Report”).

<sup>3</sup> Task Force Report at 45.

spectrum; and (ii) tackle the difficult and still unresolved issues involved in developing and enforcing strategies to deal with the real-world interference consequences of some of the spectrum-sharing ideas broadly outlined by the Task Force.

The Commission and the radio industry have also recently begun the transition of terrestrial radio to digital.<sup>4</sup> The Commission approved the introduction of In-Band On-Channel digital radio technology. IBOC will, similarly to digital television, introduce more energy into the radio bands. Allowing other users into those bands at the same time would create a very high risk of interference, potentially to both analog and digital operations. This would be particularly inappropriate because IBOC is precisely the kind of technology that the Commission should encourage. It requires no new spectrum allocation and will use the existing spectrum far more efficiently to provide enhanced services to consumers.

## **I. ACHIEVING SUCCESSFUL BROADCAST SPECTRUM REFORM**

MSTV and NAB urge the Commission to delay consideration of additional non-conforming uses in the broadcast spectrum until after the digital transition. The Task Force itself has endorsed a cost/benefit approach to introduction of spectrum policy changes, recommending for example that the Commission “focus first on initiating transition in those bands where additional flexibility will provide the greatest benefits at the least cost.”<sup>5</sup> In the broadcast spectrum, the costs of adding a second layer of additional non-conforming uses on top of the digital transition clearly outweigh the benefits.

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<sup>4</sup> In the Matter of Digital Audio Broadcasting Systems and Their Impact On the Terrestrial Radio Broadcast Service, *First Report and Order*, FCC 02-286, MM Docket 99-325 (rel. Oct. 11, 2002).

<sup>5</sup> Task Force Report at 6.

The key factors that make additional non-conforming uses unusually costly in the broadcast bands include the following:

- The introduction of new policy changes will obstruct the digital transition. Interference issues will become vastly more complex, and the cost of resolving them will almost certainly increase.
- Unlike other bands, broadcasters are less able to implement immediate spectrum policy changes because they lack control over television receivers. This problem presents additional transition costs in the broadcast bands that are not present in many other bands, where service providers also control both transmitters and receivers.
- Broadcast service reaches 98% of the American public, creating a huge amount of social welfare. It has the potential to create much more, but interference during the transition will curtail that potential.

For these reasons, NAB and MSTV urge that any near-term introduction of additional non-conforming uses and other significant modifications of existing spectrum policy should be directed away from the broadcast spectrum and toward less beneficial services where the cost/benefit calculation clearly weighs in favor of an immediate shift in policy.

**A. The Commission Should Preserve The Public Interest Benefits Of Existing, Successful Spectrum-Based Services.**

Even as we look ahead to exciting new potential uses of spectrum, the Commission has an obligation to continue supporting and nurturing existing, successful technologies and business models, such as free, over-the-air broadcasting. Changes in spectrum policy should not come at the expense of existing services on which millions of consumers depend and in which billions of dollars have been invested. Broadcasters therefore support the Task Force’s recommendation that the Commission employ “appropriate transitional

mechanisms” to “avoid degradation of existing services and uses” whenever it introduces new spectrum policies in spectrum occupied by existing service providers.<sup>6</sup>

An “appropriate transitional mechanism” in our view means a reasonable but firm policy of preserving the benefits of widely-used services by avoiding service degradation and interference to the consumers who use them. Such an approach is fully consistent with national policy, as expressed in the Auction Reform Act of 2002<sup>7</sup> and the statements of Commissioners and legislators. It is also essential to protecting the investment-backed expectations of existing service providers.

The Commission should make service preservation a priority in any future spectrum policy changes. Existing services such as broadcasting are the product of substantial investment, and provide jobs and social welfare benefits. Before the Commission permits the introduction of new uses alongside, but potentially compromising of, valuable existing services, it should ensure that its rules protect against degradation in or loss of service to consumers of the existing services caused by increased levels of interference.

**B. The Commission Must Accomplish The Digital Transition Before Introducing Other Major Changes In The Broadcast Television Bands.**

The most important and immediate priority for broadcast spectrum policy must be achieving a successful digital transition. That task is daunting and uncertain enough, and its accomplishment is the necessary predicate to any further significant changes in spectrum policy.

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<sup>6</sup> Task Force Report at 7.

<sup>7</sup> Pub. Law No. 107-195, 116 Stat. 716. Anticipating efforts to clear channels 52-69 for new services (by permitting broadcasters occupying those channels to use in-core digital allotments for analog transmission), Congress forbade waivers of spacing or interference rules that would result in “*any* degradation in or loss of service, or an increased level of interference, to *any* television household except as the Commission's rules would otherwise expressly permit.” *Id.* § 6(a) (emphasis added).

As the Task Force observed, “[i]n the case of broadcasting, evolution towards greater flexibility is governed for the time being by the statutorily-mandated DTV transition process, *making additional regulatory changes impractical at least until that process is complete.*”<sup>8</sup> MSTV and NAB strongly agree that imposing additional non-conforming uses in the broadcast band — particularly if they raise interference issues — is a question that can only be fully understood and intelligently addressed after the digital transition.

The spectrum allotted for the DTV transition is already crowded, leaving no room for another layer of complication. To start the transition, the Commission doubled the number of TV channels in the existing television band. Before the transition is over, it will have to crowd in approximately 97 stations that have both analog and digital channel assignments above channel 51 and will thus need new, in-core channels, plus another 140 in-core digital construction permits that are yet to be granted.<sup>9</sup> As a further constraint, the Commission recently added 568 LPTV stations with protected “Class A” status.<sup>10</sup>

Injecting additional uses of broadcast spectrum at this stage will obstruct and burden the transition and drain the momentum. Additional uses will generate more interference complaints and disputes, while simultaneously making them more difficult to resolve by multiplying the sources of interference. This in turn will lead to more lost service. Because DTV is an all-or-nothing technology, loss of service means not just a poor picture, but no picture

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<sup>8</sup> Task Force Report at 46-47 (emphasis added).

<sup>9</sup> *Second Periodic Review of the Commission’s Rules and Policies Affecting the Conversion to Digital Television*, Notice of Proposed Rulemaking, FCC 03-8, MB Docket No. 03-15, ¶ 61 (rel. Jan. 27, 2003).

<sup>10</sup> See FCC News Release, *Broadcast Station Totals as of September 30, 2002* (Nov. 6, 2002).

at all. Consumers will suffer further disillusionment if they are unable to receive service on their DTV sets. Any one of these consequences could derail or delay the transition.

**C. Real-World DTV Is Proving To Entail Unexpected Interference Issues; The Commission Must Grapple With This Reality Before Introducing Additional Assumptions About Interference To Digital Broadcasting.**

The adjustment period that broadcasters are undergoing as they work out co-channel DTV interference issues provides another reason to delay consideration of any changes in spectrum policy that would introduce secondary sources of interference in broadcast bands. DTV interference issues between licensed broadcasters are turning out to be particularly onerous, in part because the properties of the equipment involved are unfamiliar, and in part because the prediction methodology used to create the DTV table may not replicate reality under many circumstances.<sup>11</sup> Moreover, the interference problems may be exacerbated as digital television stations shift from low power to full power operations.

Broadcasters recognize and accept that when the number of television stations is doubled in the same amount of spectrum, there are bound to be complications such as those described above. By the same token, the Commission must recognize that these primary-to-

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<sup>11</sup> Among the many examples are the following three cases:

(1) A noncommercial digital station (WHRO-DT) operating out of Hampton Roads-Norfolk, Virginia, caused interference to an analog station (WBOC-TV) in Salisbury, Maryland, which was not predicted by the Longley-Rice propagation model used to calculate DTV interference. The parties have reached a settlement agreement under which WHRO-DT has agreed to reduce its power by 75% for the duration of the DTV transition.

(2) An analog station (WOOD-TV) in the Grand Rapids-Battle Creek-Kalamazoo, Michigan market installed a translator in an area severely affected by interference from a noncommercial digital station (WMVS-DT) broadcasting out of Milwaukee, Wisconsin.

(3) An analog station in Wildwood, New Jersey has alleged that it is receiving interference from a digital station broadcasting out of Norfolk, Virginia. The Norfolk station's authorized ERP is 950 kW. It had been operating at 724 kW pursuant to an STA, but has voluntarily reduced its power to 290 kW. A complaint has been pending with the FCC since August 2002.

primary problems need to be resolved and the transition completed before new, secondary sources of interference are introduced into the band.<sup>12</sup> Until DTV interference issues are resolved, the addition of non-DTV interference sources will hopelessly obstruct and delay the resolution of an already difficult set of problems.

## II. MINIMIZING INTERFERENCE

The Task Force Report correctly recognizes the importance of interference management. But the Report stops short of providing details on how the Commission can deal with real-world interference concerns — particularly interference that already exists. As the Task Force Report notes “[i]nterference management has become more difficult because of the greater density, mobility and variability of RF emitters and because users have been granted increased flexibility in their spectrum use.”<sup>13</sup> In addition, the proliferation of low-power unlicensed and other secondary devices has caused cumulative interference that is hard to predict and even harder to control. The offending emitters are unlicensed, and therefore impossible to track once in the hands of consumers, who are not accountable to the Commission.

### A. **The Commission Must Develop A Set Of Proactive Strategies For Tackling The Problem Of Interference Before Introducing New Sources Of Interference Into A Band.**

The increasing and unpredictable interference experienced by licensed services has challenged traditional approaches to interference management. In the past, the Commission

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<sup>12</sup> Another example of the uncertainties prevalent during the DTV transition involved interference between DTV transmissions and medical telemetry equipment. The problem took both the television stations and hospitals by surprise in 1998, when DTV transmitters first began operating. *See Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service*, 14 FCC Rcd 16,719, 16,722 (1999) (describing a March 1998 incident involving interference from a DTV station in Texas to medical telemetry equipment at a nearby hospital).

<sup>13</sup> Task Force Report at 25-26.

typically relied on predictive analyses and defined interference protection rights through upper limits for in-band transmitter power, out-of-band emissions, and height and mileage limitations. This system had the advantage of being relatively easy to implement, and was reasonably effective when most RF services involved large, licensed entities with relatively few emitters, such as broadcasting. However, the Task Force correctly notes that the growth in the numbers and variety of RF emitters, including unlicensed emitters, have made predictive interference analyses difficult, and have raised serious concerns about the adequacy of the Commission's current approach to its obligation to protect licensed services from interference.<sup>14</sup>

For example, cumulative interference led to the significant deterioration of AM radio quality.<sup>15</sup> While AM stations continue to provide a vital and popular service, failure to protect the AM band from cumulative interference has inevitably reduced the value of the band to licensees and impaired the service enjoyed by AM radio listeners. The problem in the AM band and other bands partly reflects regulatory erosion — the gradual waiver or relaxation, either *de jure* or *de facto*, of interference rules to accommodate expediency and short-term policy objectives.<sup>16</sup> Such problems may also result in part from reliance on mistaken interference

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<sup>14</sup> *See id.*

<sup>15</sup> *See Amendment of the Commission's Rules to Improve the Quality of the AM Broadcast Service by Reducing Adjacent Channel Interference and by Eliminating Restrictions Pertaining to the Protected Daytime Contour*, 4 FCC Rcd 3835, 3842 (1989) (Separate Statement of Commissioner Dennis) (noting that the FCC's policies resulted in increasing interference to AM radio service and corresponding listener dissatisfaction).

<sup>16</sup> Section 6 of the Auction Reform Act of 2002, discussed *supra* at n.7, was passed to preempt the threat of similar erosion in connection with broadcast spectrum band clearing.

predictions.<sup>17</sup> In either case, avoiding the “AM-ization” of all broadcast spectrum requires a consistent commitment to real-world interference protection.

As the Task Force suggests, the current RF environment and interference concerns require the Commission to consider the actual interference experienced by licensed services. The Task Force’s discussion of the interference temperature metric recognizes the need to (1) quantify existing interference, and (2) where possible, base interference management decisions — including decisions on whether to allow new devices and technologies to operate in a particular spectrum band — on actual, measured interference rather than on sometimes inaccurate interference predictions.

Under the Task Force’s approach, the Commission would monitor the interference temperature in a given band, and then use the interference temperature metric to establish a quantitative level of interference that a receiver would have to tolerate. Emitters would then use “interference thermometers” at various locations to measure the interference temperature in a particular band at a particular time, and would use automatic transmitter power control (“ATPC”) technology to ensure that the maximum acceptable interference temperature is not exceeded. Under such an approach, licensed services would be able to design receivers that tolerated the maximum acceptable interference temperature, and other potentially-interfering devices would only transmit if doing so would not exceed the interference temperature limit. Thus, in theory, licensed services would not face the problems of the AM band discussed above,

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<sup>17</sup> The problems with the Commission’s current predictive approach to interference management are highlighted in the 800 MHz public safety/Nextel spectrum swap proposal proceeding. *See Improving Public Safety Communications in the 800 MHz Band*, FCC 02-81, WT Docket No. 02-55 (rel. Mar. 15, 2002). Public safety users in the 800 MHz band are increasingly experiencing interference from neighboring cellular/PCS providers, even though all parties are operating within established technical limits — an example of the failure of the Commission to predict accurately the interference caused by the growth of new services.

in which cumulative interference ultimately caused an increase in the noise floor and a deterioration of AM radio quality.

However, even assuming the interference temperature concept is a valid approach in theory, there remain practical, real-world issues that must be resolved before the theory can be fully embraced. The Task Force did not provide sufficient details on the implementation of its recommendations for interference avoidance, making it difficult for MSTV and NAB to evaluate their effectiveness. While the Task Force's recommendations are perhaps a step in the right direction, they fall short of providing a road map for the Commission to address the serious interference concerns that exist today and that will continue to exist as the number and variety of RF services and emitters increase.

To proactively address growing concerns of interference to licensed services, we propose that the Commission adopt the following strategic priorities, discussed in further detail in the sections below:

- Preservation of the benefits associated with analog broadcasting, and of the future benefits associated with digital broadcasting.
- Reliance going forward on actual interference levels, and a commitment to remedy existing interference problems caused by incorrect predictions.
- Establishment of robust equipment performance standards.
- Introduction of genuine accountability for interference.
- Careful and realistic assessment of new technologies so as to avoid interference to existing services.
- Encouragement of common-business-interest spectrum communities that facilitate spectrum sharing among users with compatible interests.

**B. The Commission Must Confront The Challenges Involved In Implementing A Shift To Real-World Interference Control.**

Recent experience with DTV interference has reminded broadcasters and the Commission alike that interference prediction is an inexact science.<sup>18</sup> As the Commission has come to realize on several occasions — the AM radio band and the 800 MHz public safety band are two examples — real-world interference levels may greatly exceed predicted levels. Moreover, if the Commission increasingly adopts shared spectrum allocations and permits unlicensed devices to operate in licensed spectrum bands on an underlay basis, the cumulative interference caused by secondary or underlay users will be increasingly difficult to predict.<sup>19</sup> Already, the Commission’s current interference management approach of relying on interference predictions has resulted in interference among licensed primary users when predictions have been inaccurate — compromising the value of spectrum to primary licensed users. As the Task Force recognized, optimal interference protection rules should rely on *actual*, rather than predicted, interference.

As a matter of broad policy, it is exactly right to stress actual over predicted interference. But implementation of real-world interference measurements and interference control poses a series of fundamental challenges that the Task Force left unresolved. As with several other Task Force recommendations, the devil here will be in the details. Before simply forging ahead with spectrum management policies that assume that the Task Force’s interference

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<sup>18</sup> *See supra* Section I.C.

<sup>19</sup> As noted earlier, once the interference-causing devices have entered the market, authorities cannot realistically locate them and make them cease operation (or otherwise stop causing interference) — particularly when the devices are unlicensed and in the hands of consumers.

avoidance recommendations will work, the Commission must work through the details of implementing real-world interference control.

MSTV and NAB have several concerns about how the Commission would implement the interference temperature metric and ATPC technology envisioned by the Task Force.

- First, the Commission must develop an appropriate process for establishing the initial metric that constitutes the maximum permissible interference temperature. It should reflect the quality of the receivers that are actually in users' hands, and should set the maximum temperature low enough to avoid rendering obsolete any receiver still in widespread use. (For example, a future interference temperature for digital television broadcasting would have to be set low enough to ensure protection of existing DTV receivers already in consumers' hands.)
- Second, there is no currently acceptable mechanism for measuring the interference temperature. The Task Force acknowledges that there is at present no accepted way to quantify the noise floor. Moreover, the interference potential of signals depends on the RF spectral wave shape and other signal characteristics,<sup>20</sup> so it is unclear how interference thermometers could accurately evaluate all signals in a particular band.
- Third, while interference thermometers can theoretically measure the interference temperature in their immediate vicinity, there is no easy way for them to determine the interference temperature at all locations where a device's emissions could be detected.

Without knowing the interference temperature at all locations at which its emissions

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<sup>20</sup> See Motorola, *A White Paper on the Exploitation of "Spectrum Holes" to Enhance Spectrum Efficiency*, at 5 (Oct. 28, 2002) (submitted in Docket No. 02-135).

could be detected, a device with ATPC will not be able to determine whether its emissions would surpass the maximum allowable interference temperature. While it is possible to project the increase in interference temperature over the range of the transmitting signal, such projections are extremely difficult and vary based on the surrounding terrain. Furthermore, any such projections necessarily rely on predictive analyses rather than on actual interference measurements, running counter to the purpose of using the interference temperature metric instead of trying to predict interference.

- Fourth, the Task Force recognizes that accurate, real-time measurement of the interference temperature throughout a service area would require a complex grid of spectrum monitoring stations that would continuously scan the RF environment and communicate with each other.<sup>21</sup> This approach may work in theory, but would be extremely difficult to implement.
- Fifth, interference thermometers must measure the interference temperature not only in the bands in which they transmit, but also in adjacent bands in which out-of-band emissions would occur if the device transmitted. For example, even if the interference temperature in a particular band was well below the permissible limit, a low-power unlicensed device's out-of-band emissions could cause the interference temperature in an adjacent band to be exceeded, particularly if the interference temperature in the adjacent band was very close to the permissible limit and reflects the cumulative effect of many unlicensed devices.

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<sup>21</sup> Report of the Interference Protection Working Group at 17-18 (Nov. 15, 2002) (“IPWG Report”).

- Sixth, the Task Force’s approach to interference management — in which unlicensed devices detect the interference temperature using interference thermometers, and then use ATPC technology to control their transmissions based on a comparison of the measured interference temperature with the permissible limit — requires that the interference thermometers be accurate. The Commission must therefore adopt stringent quality control measures to make sure that unlicensed devices only transmit when the interference temperature is below the acceptable limit.
- Finally, while the interference metric seems to be a useful approach for monitoring the interference environment, the Task Force did not adequately discuss how it could be used to remedy existing and future interference. With respect to existing interference problems, the interference temperature approach could serve a useful monitoring function to assess whether the interference situation is improving or getting worse. However, it provides no solutions for addressing interference caused to existing receivers. With respect to future spectrum allocations, the interference temperature approach means little unless it is accompanied by strict receiver performance criteria and aggressive and efficient enforcement.

As discussed above, the interference management approaches discussed by the Task Force are a long way from being implemented. The Commission must confront the challenges involved in implementing the Task Force’s approach before moving ahead with spectrum management policies that assume that they are already in place.

**C. The Commission Should Follow The Task Force’s Suggestion And Introduce Robust Equipment Performance Standards.**

As the Task Force notes, interference is as much a function of receiver design as it is of transmitted signal strength. With appropriate receiver standards in place, receivers would

be able to discriminate between desired and undesired signals (including out-of-band emissions by devices operating in other bands). With this in mind, the Task Force's approach to interference management relies on assumptions regarding the actual performance of receivers by assuming that receivers can tolerate up to a certain interference temperature limit or that all receivers can tolerate the same amount of interference.

Before permitting the introduction of new unlicensed services in a particular band, the Commission must ensure that receivers for existing licensed services in the same or adjacent bands can actually tolerate the maximum permissible interference temperature.<sup>22</sup> This requires that the Commission adopt appropriate receiver performance standards and ensure that existing devices that do not meet these standards are no longer being used by consumers. This is particularly important in the broadcast bands because, as the Task Force correctly recognizes, broadcasters do not have the ability to dictate the characteristics of the receivers used to receive their signals, and cannot force consumers to purchase receivers that meet the interference temperature threshold performance requirements.<sup>23</sup>

Going forward, the Commission must also commit to aggressively prescreen receivers and devices to assure compliance with performance standards.<sup>24</sup> Without aggressive

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<sup>22</sup> As suggested in the previous section, one way of assuring that receivers for licensed services can tolerate the interference temperature limit in a given band is for the Commission to conduct detailed studies on existing receivers and the levels of interference they are able to tolerate *before* establishing the limit for that band. All receivers manufactured from that point on should then be required to tolerate the established interference temperature limit. The Commission, however, must also consider whether additional consumer costs for high quality receivers can be justified by the benefits from additional spectrum use.

<sup>23</sup> See IPWG Report at 25; Report of the Spectrum Rights and Responsibilities Working Group at 43 (Nov. 15, 2002).

<sup>24</sup> Presumably, the prescreening could be done by an entity other than the Commission, but the Commission must establish appropriate prescreening procedures to assure that devices meet the receiver performance standards.

prescreening, substandard devices will gradually filter into the market, causing interference and eroding the value of spectrum to other users.<sup>25</sup> In our view, an appropriate prescreening regime would go well beyond self-certification. The Commission should be prepared to cooperate with users of the band (the potential victims of interference) to test receivers *before* they enter the market. The Commission should also consider establishing an advisory committee that would assess receiver performance as well as other interference issues.

**D. Permitting Unlicensed Devices Limits Future Spectrum Use.**

Unlicensed allocations are difficult to undo, given the sunk costs of consumers in devices, and should be created with great care. Once spectrum is allocated to unlicensed use, it cannot be repurposed efficiently to other “higher and better” uses because of the lack of control over devices once they are in the hands of consumers. Even though unlicensed devices may have no right to continued use of particular spectrum and be required by rule to cease operating if they cause harmful interference to licensed services,<sup>26</sup> it becomes impossible to move unlicensed devices from a particular band even if they ultimately cause interference. This is all the more problematic when the unlicensed devices share spectrum with licensed services and cause interference to such services.

These concerns — which may even impact national security in situations in which the unlicensed device shares spectrum with critical military, homeland security, and public safety users — mitigate against hasty allocation of too much spectrum to unlicensed uses. As this

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<sup>25</sup> The Commission must also address exactly how it intends to assert legal jurisdiction and actual control over receivers, particularly consumer devices. We note that the Consumer Electronics Association has challenged the Commission’s power to mandate DTV tuners, even when specific statutory language supports it. *See* Consumer Electronics Association v. FCC, No. 02-1312 (D.C. Cir. filed Oct. 11. 2002).

<sup>26</sup> 47 C.F.R. § 15.5.

nation observed on September 11th, broadcasting played a vital role in the dissemination of critical information to the American public. The Commission recently established the Media Security and Reliability Council to help insure that over-the-air communications remain operational during national emergencies.<sup>27</sup> It would be unthinkable to have American citizens denied access to critical information because a variety of unlicensed devices are interfering with radio or television receivers.

In addition, before allocating spectrum to unlicensed uses, the Commission must assess realistically whether adequate and affordable technology exists to solve interference-related problems on a practical level, and then must then adopt effective mechanisms to police and enforce these solutions. The Commission must also recognize that its rules must anticipate not only the interference-minimizing technology available in a few high-end devices, but also the less effective technology available for cheaper mass-market devices. Any interference avoidance approach which depends upon technology must recognize the inevitable trade-off between cost and sophistication of technology, and must either make sure that all devices have the necessary advanced interference-minimizing technology or allow for the proliferation of less-advanced devices. In other words, any spectrum policy that contemplates the introduction of new devices and technologies must also anticipate, from the outset, the undesired signal runoff from those devices through substandard devices, out-of-band emissions, etc. To disregard these problems would run the serious risk of degrading existing services and devaluing licensed spectrum.

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<sup>27</sup> See FCC News Release, *FCC Announces Creation of Media Security & Reliability Council* (Mar. 28, 2002).

**E. The Commission Should Encourage Common-Interest Communities Of Spectrum Users.**

The Task Force correctly recognizes the advantages of grouping together technically compatible systems and devices, noting that such spectrum zoning reduces the risk of interference and allows for more efficient spectrum use.<sup>28</sup> One model the FCC may want to explore is the “common business interest community” approach. This model envisions a band occupied by spectrum users sharing both similar business interests and technical compatibility.

The common business interest community model draws upon the theory of norms that suggests that parties are better able to maintain order among themselves — without having to resort to legal enforcement — when they share common interests, have continuing relationships with each other, and have reliable information about each other.<sup>29</sup> In the context of spectrum policy, common-interest communities would be comprised of users who employ similar technology, making disputes over interference easier to handle than in situations in which diverse users disagree as to the nature of interference their respective operations would cause each other. These users would share a right to exclude outsiders, but among themselves would treat the band as a commons.

The advantage of common business interest communities is that they enhance incentives to address effectively all the issues identified in this section of our comments, including interference protection. The result is a more intense and effective use of the spectrum in question. These vital issues may not be adequately addressed when such commonality of interest is lacking. In a common-interest community, when situations arise that place two or

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<sup>28</sup> Task Force Report at 22.

<sup>29</sup> See generally Robert C. Ellickson, *Order Without Law: How Neighbors Settle Disputes* (1991).

more users' interests against each other, there is an incentive for parties to make concessions and reach a solution since the tables may well be turned the next time the problem arises. Because the spectrum users share a commonality of interest, their business plans are not likely to be diametrically opposed, making problem solving easier. Broadcasters' and cable providers' experience with the Electronic News Gathering in the 2 GHz Band demonstrates that users with a strong commonality of interest can accomplish complex coordination tasks with a minimum of friction.

**F. The Commission Must Clearly Establish Who Is Responsible For Interference And Strictly Enforce Accountability For Causing Interference.**

Apart from suggesting that the Commission needs to devote more resources to enforcement of its spectrum-related rules, the Task Force provides little detail on how the Commission would enforce accountability for interference. Someone must pay the costs associated with monitoring interference and enforcing interference rules, and someone must be accountable for additional costs that arise when interference occurs. One cannot simply assume that the courts will step in to resolve such problems. Also, interference problems can only be efficiently resolved if they are quickly resolved. Interference diminishes the value of spectrum, and parties that cause unlawful interference should bear the costs of correcting their own interference.

The Task Force's interference management proposals fail to account for situations in which its approaches are not followed. For example, the Task Force assumes that unlicensed devices operating in licensed spectrum on an underlay basis would accurately measure the existing interference temperature and use ATPC technology to transmit only if doing so would not cause the permissible interference temperature limit to be exceeded. However, this approach fails to account for the malfunctioning or "bad actor" device that either measures the interference

temperature inaccurately or transmits even though the interference temperature limit is exceeded. How would such interference-causing devices be located and stopped? This is a critical issue, because without an effective means of locating and handling interfering devices, all of the Task Force's interference avoidance recommendations would fail in real-world implementation.

The Commission must also clearly establish who is responsible when the cumulative interference exceeds the maximum permissible limit. When multiple secondary or unlicensed users are transmitting in a given frequency band and the interference temperature is exceeded, to which party or parties is liability assigned, and how is liability apportioned among multiple sources of interference? Also, as a practical matter, how will the Commission determine which device was at fault?

The Task Force proposals fail to articulate a clear strategy for effectively enforcing interference rules based on its proposals for interference avoidance. The lack of any enforcement strategy at present signals that, at a minimum, there are years of work ahead to develop a viable system for policing unauthorized emissions or levels of emissions. In the meantime, the digital transition should be allowed to take its course.

### III. CONCLUSION

MSTV and NAB recognize that the increasing demands placed on spectrum may require new, creative approaches to spectrum use. We stand ready to work with the Commission to help facilitate the most efficient use of spectrum in all bands. Our starting point must be to ensure the continued vitality and competitiveness of existing broadcast services and new digital services in this new policy environment. MSTV and NAB thus urge the Commission to consider the issues and concerns reflected in these comments.

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